

Work Order ID 137872

Wednesday, October 14, 2015 11:22:41 AM

137872

U/R

Page 1

Item ID: D412-664-403 Accept *N900040100* Setup Start *NS1*
 Revision ID: URF 15-561 Stop *NS2*
 Item Name: 412 Stainless Steel Aft Crosstubes - High
 Start Date: 10/14/2015 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 10/14/2015 Req'd Qty: 1.00 *1* Customer:
 Reference:

Approvals: Process Plan: MLJ 1 Date: OCT 14 2015 Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D412-664-443	A U/R <u>OK</u> <u>15/11/20</u>	DAS 6 9-89							
100	Document Control	0.00							
100	DOCUMENT CONTROL								DAS 38 9-89
DC	Memo	0.00							
Doc.Control -USB or Paperwork	Photocopy bluefile & type labels per PPPD412-664-403								<u>15-11-16</u>
									<u>CHG001</u>
110		0.00							
110	BENDING MACHINE - CROSSTUBES								
CNC Bend 2	Memo	0.03							
CNC Alpha 160 Bender	Bend tube as per Dwg D412-664-443 using CNC bender program _____ and Folio FT _____								<u>15-10-19</u>
	****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS****								
127	QC15- Crosstube Dimensional Check	0.00							
127									DAS 49 9-89
QC	Memo	0.00							<u>15/10/19</u>
Quality Control	***MARK CUT LINES***								

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Item ID: D412-664-403

Accept

N900040100Setup Start ***NS1***

Revision ID: URF 15-561

Stop ***NS2***

Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 10/14/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 10/14/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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128

0.00

128

Crosstubes

Memo

0.01

CUT TUBE AT HEIGHT ON FAI SHEET

VERF HEIGHT 24.62 BY QC 15 LEVEL INSPECTOR mmlVERF TWIST .176 BY QC15 LEVEL INSPECTOR mmlBL 15/10/19

130

0.00

130

Crosstubes

Crosstubes

Memo

0.03

1- Drill Tube as per Dwg D412-664-443 Using DT 8550/8551 Drill Jigs,
Set-up drill table as per QSI 010

2 -Deburr

3- Engrave Part # and Batch # as per Dwg D412-664-443

4-Remove all marks from tube within limits of D412-664-43 DWG TL15-10-20BL/TW 15/10/20

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Revision ID: URF 15-561 **Stop** ***NS2***
Item Name: 412 Stainless Steel Aft Crosstubes - High
Start Date: 10/14/2015 **Start Qty:** 1.00 ***1*** **Cust Item ID:**
Required Date: 10/14/2015 **Req'd Qty:** 1.00 ***1*** **Customer:**
Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____ **Run** **Start** ***NR1***
QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____ **Stop** ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140	300 Co- Inspect dimensions to drawing 9-89 QCS	0.00				1			DAS 38 9-89 OCT 21 2015
140	QC	0.00							
Quality Control	Memo								
174	Outsource process - NDT per QSI038 4.1	0.00							
174	Outsource2	3.00							
Outsource process - NDT	Memo								
	ISSUE P/O TO ACCUREN: 30242								
176	Receive & Inspect for Damage & Mat'l Certs	0.00							
176	Packaging	0.00							
Packaging	Memo								
									DAS 6 9-89 OCT 23 2014

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 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
178	QC5- Inspect part completeness to step on W/O	0.00							
178									
QC	Memo	0.00				1			QB 15-10-29
Quality Control									
180		0.00							
180									
SprayPaint	SprayPaint					1			DAS 41 9-89
Spray Painting	Memo	0.01							15-10-27
	1-Prime inside & outside crosstube as per QSI 005 4.2								
	BATCH: <u>133084</u>								
	2- MASK UNDERSIDE OF CROSSTUBE AS SHONE ON DWG BEFORE PAINTING								
	3 -Paint Outside of Tube as per Dart QSI 005 4.2								
	BATCH: <u>133325</u>								
	4- After painting remove masking and apply matte clear coat per QSI005 4.2								
	CLEAR BATCH: <u>132664</u>								

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Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID: URF 15-561

Stop

NS2

Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 10/14/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 10/14/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

190

QC14- Inspect Spray Paint

0.00

190

QC

Memo

0.00

Quality Control

DAS

38

9-89

NOV 13 2015

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Item ID: D412-664-403 Accept ***N900040100*** Setup Start ***NS1***
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Required Date: 10/14/2015 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200	Crosstubes	0.00							DAS
200						1			41
Crosstubes									9-80
Crosstubes									15-11-11

Memo

1- Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 12. Install supports clamps using as per Dwg D412-644-443. Install clamp with rubber cushion as per DWG. note 13. ***ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT*** Torque clamps on support to 80-100 IN-LBS AS PER DWG.

A/R scoth-weld DP460 BATCH #: 132895
EXP DATE: 8/16

2- **IF NOT ALREADY PRESENT ON CHAFFING SHEILD.** Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. Install and torque clamps on chafing shield to 40-50 IN-LBS AS PER DWG.

A/R Proseal 890 Batch: 133071
EXP DATE: 2/16

AFTER FINISH CURE TIME 24H
START CURE TIME: 15-11-11
FINISH CURE TIME: 15-11-12

PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.

SEE
Attached

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Item ID: D412-664-403

Accept

N900040100Setup Start ***NS1***

Revision ID: URF 15-561

Stop ***NS2***

Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 10/14/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 10/14/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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210

QC5- Inspect part completeness to step on W/O

0.00

210

QC

Memo

0.00

Quality Control

PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER
CURED FOR 24H.

NOV 13 2015

220

Pick Kit

0.00

220

Packaging

Memo

0.00

Packaging

DAS
6
9-89

NOV 11 2015

DAS
28
9-89

230

QC4- 100% Inspect kits for completeness

0.00

230

QC

Memo

0.00

Quality Control

AS
38
9-89

15-11-16

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 Required Date: 10/14/2015 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	Packaging	0.00				200			
240									
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPPD412-664-443								
	Location: <u>BKT 002</u>								
	PPP Rev: _____								
250	QC21- Final Inspection - Work Order Release	0.00							
250									
QC	Memo	0.00							
Quality Control									

[Handwritten Signature]

NOV 18 2015

MLJ NOV 19 2015

[Handwritten Signature] 20151118

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D412-664-403

Required Date: 10/14/2015

Required Qty: 1.00

Comments: IPP REV:A 13.10.25 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D412-664-443TRN		Manufactured	No			110	Each	0.0000	1	1			
D412-664-443TRN Crosstube Turning Detail B/32993													
D3595-063-530		Manufactured	No			200	Each	98.0000	2	2			
D3595-063-530 Rubber Cushion 0.63" wide x 5.30" Long DAS 41 9-89 15-11-11													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				FG		1							
				82656		1							
				LG051		97							
				115704		22				2			
				132515		75							
D4909-1		Manufactured	No			200	Each	12.0000	1	1			
D4909-1 Support DAS 41 9-89 15-11-11													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				LG053		12							
				130094		2							
				135507		10				1			
D4910-1		Manufactured	No			200	Each	12.0000	2	2			
D4910-1 Chaffing Shield DAS 41 9-89 15-11-11													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				LG054		12							
				134367		2							
				135444		10				2			

Picklist Print

Wednesday, October 14, 2015 11:22:45 AM

Work Order ID: 137872

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Parent Item: D412-664-403

D412-664-403

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 10/14/2015

Required Date: 10/14/2015

Start Qty: 1.00

Required Qty: 1.00

MS21920-26

Purchased

No

200

Each

18.0000

4

4

MS21920-26

Clamp

DAS

41

9-89

15-11-11

Location

Loc Qty

Loc Code

LG050

8

109206

6

M132045

2

LG057

10

M133234

10

MS21920-28

Purchased

No

200

Each

184.0000

2

2

MS21920-28

Clamp

DAS

41

9-89

15-11-11

Location

Loc Qty

Loc Code

FG

1

105884

1

LG050

126

M130400

50

M130665

2

M133090

38

M133091

36

LG051

57

M132169

19

M132522

38

AN6-40A

Purchased

No

220

Each

144.0000

4

4

AN6-40A

3/8-24 BOLT X 3"LONG

DAS
38
9-89

DAS

6

9-89

NOV 11 2015

DAS

28

9-89

Location

Loc Qty

Loc Code

ST286A

144

M131618

20

M131803

100

M133316

24

Picklist Print

Wednesday, October 14, 2015 11:22:45 AM

Work Order ID: 137872

137872

Parent Item: D412-664-403

D412-664-403

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 10/14/2015

Required Date: 10/14/2015

Start Qty: 1.00

Required Qty: 1.00

AN6-41A Purchased No 220 Each 73.0000 2 2

AN6-41A

Bolt

DAS
38
9-89

**

DAS
6
9-89
DAS
28
9-89

Location Loc Qty Loc Code

ST286A 62
M129913 2
M131957 60
ST333 11
M131618 11

AN960JD616 NAS1149D0663J Purchased No 220 Each 0.0000 18 18

AN960JD616

Washer

DAS
38
9-89

**

132256
68-6
9
9-89
DAS
28
9-89

MS21042L6 Purchased No 220 Each 365.0000 6 6

MS21042L6

Nut

DAS
38
9-89

**

DAS
28
9-89

Location Loc Qty Loc Code

CCK007 100
m133031 100
ST273A 143
m131624 143
ST305 105
m129909 1
m132262 4
m133134 100
t260a 17
m131317 17

DAS
6
9-89

NOV 11 2015

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

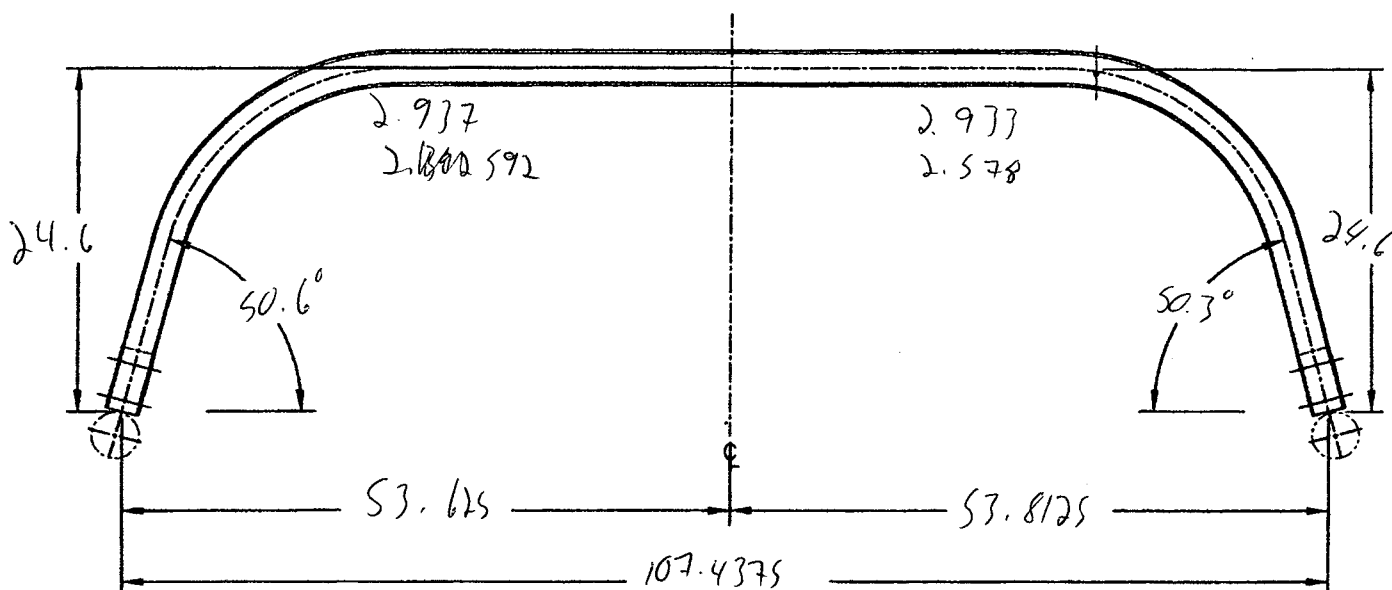
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

DART AEROSPACE LTD		Work Order: 132872
Description: Crosstube High Aft (412)		Part Number: D412-664-403
Inspection Dwg: D412-664-443 Rev: A		Page 1 of 1

Required Dimension	Min	Max
Height	24.12	24.62
1/2 Span	53.56	53.82
Angle	49°	52°
Total Span	107.12	107.64
Bending Passes	8	--
Crushing	--	7%



	Side A	Side B
Bending Passes	4	5
Crushing	6.2%	6.4%
Comments		

QC15 Inspection		DAS
Date		49
		9-89

Rev	Date	Change	Revised by	Approved
A	14.07.08	New Issue	KJ	UP

Item	Qty -443	Part Number	Description
1	X	D412-664-443	CROSSTUBE ASSEMBLY (412 HI AFT)
2	1	D6020-132	CROSSTUBE MATERIAL (132" MIN. LENGTH)
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-26	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6020-132
FINISHED LENGTH = 130.10±0.060 (BEFORE BENDING/TRIMMING)
 - FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
 - TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
 - UNITS: INCHES UNLESS OTHERWISE NOTED.
 - BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
 - IDENTIFICATION: SCRIBE DART P/N "D412-664-443" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
 - WEIGHT: 80.2 lb AFTER MACHINING
88.7 lb FINISHED WEIGHT
 - PART IS SYMMETRIC ABOUT CENTERLINE.
 - EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- BENDING**
- BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
 - LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

- INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT.
- IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO 137872 MLC
15-10-14

UNDER REVIEW

UP 15/4/28
URF 15-561

UNDER REVIEW

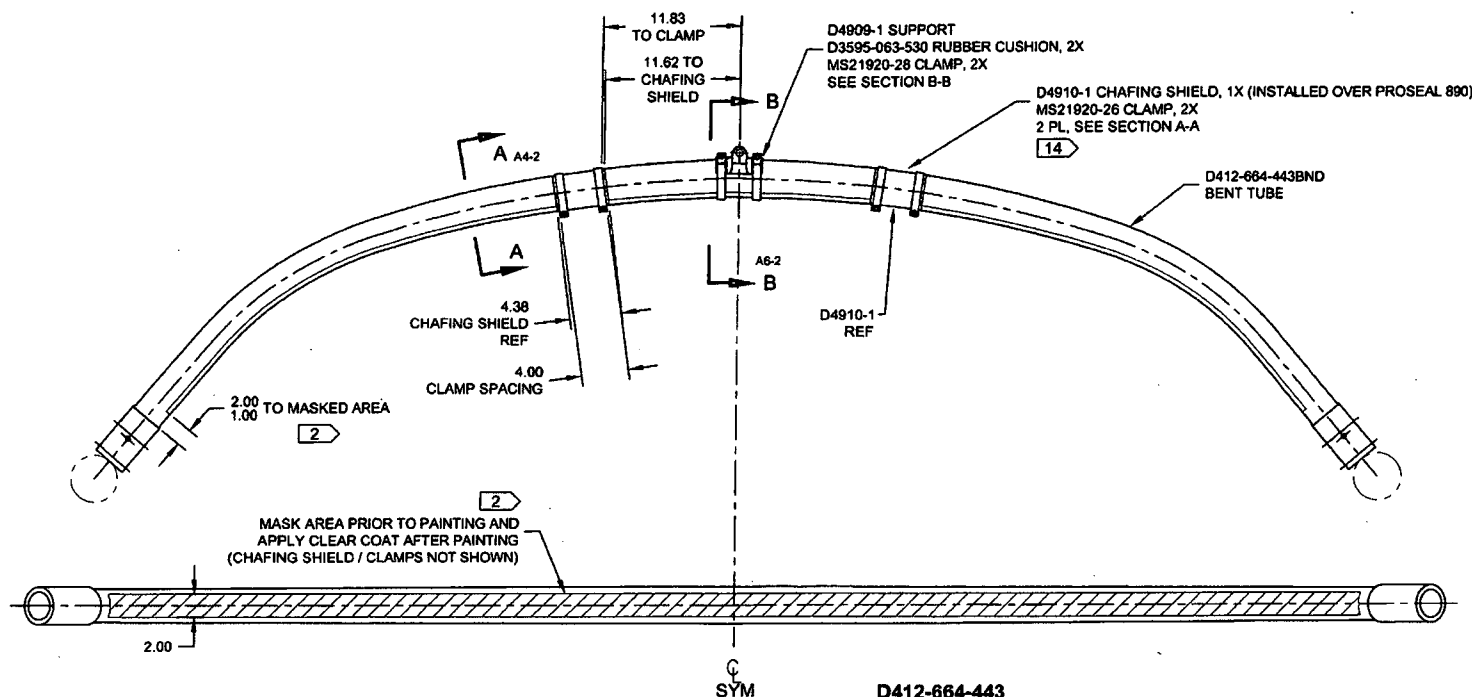
OK
P
M/M
15/7/20
URF 15-691

RELEASED
R 2014-05-26
MD

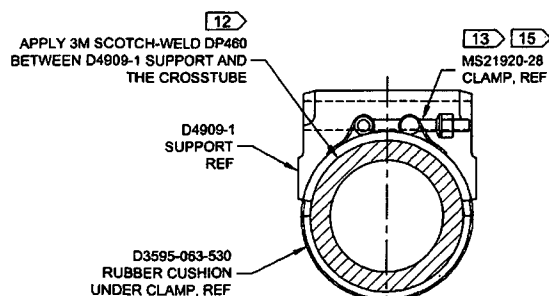
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APPROVED			
DE APPR.			
DATE	14.04.01		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D412-664-443	REV. A SHEET 1 OF 4
TITLE CROSSTUBE ASSY (412 HI AFT)	SCALE NTS

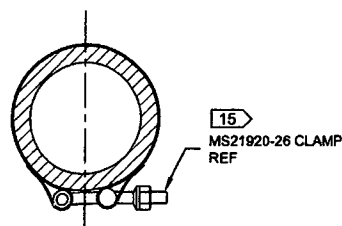
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D412-664-443
ASSEMBLY DETAIL



SECTION B-B D4-2
SCALE 4X



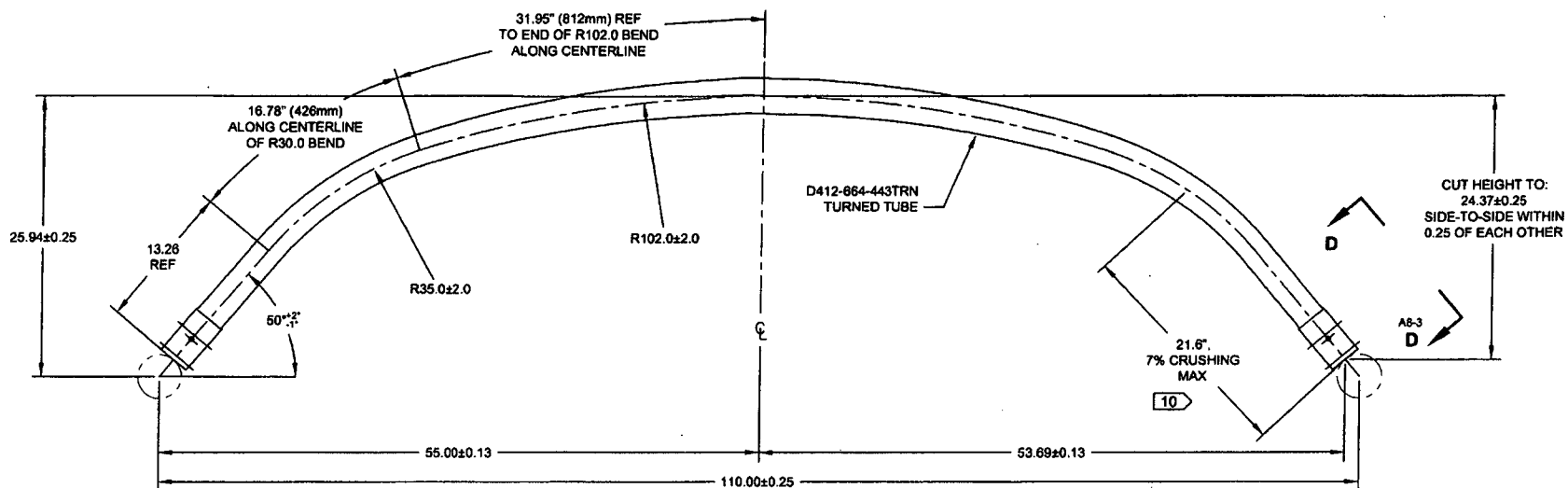
SECTION A-A C6-2
SCALE 4X

UNDER REVIEW
OK 14/14/14 14/7/16 14/7/16

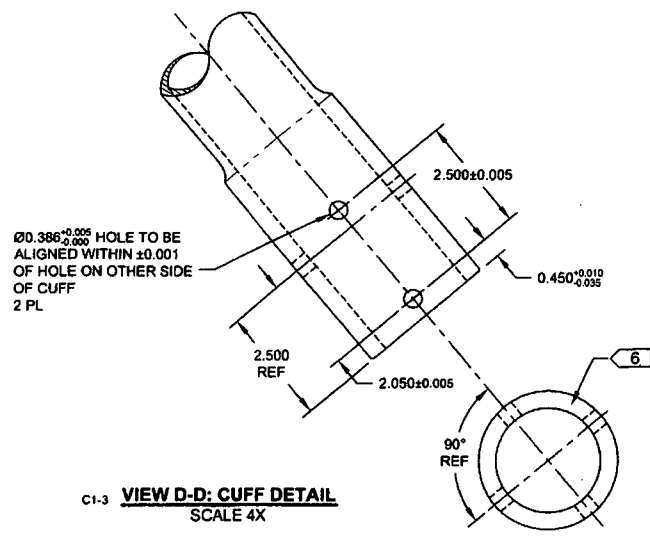
RELEASED
2014-05-26
WMP

UNDER REVIEW
14/15/14/20

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO. D412-664-443	REV. A
MFG. APPR.			SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI AFT)	NTS
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D412-664-443BND
BENDING DETAIL



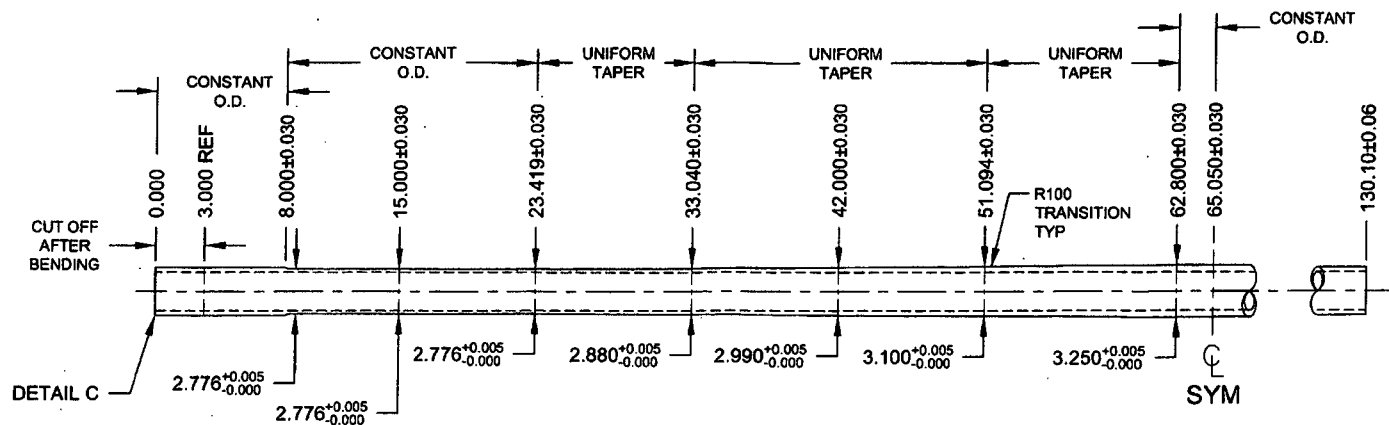
VIEW D-D: CUFF DETAIL
SCALE 4X

OK
P. 15/14
UNDER REVIEW
11/7/36

RELEASED
2014-05-26

UNDER REVIEW
P. 15/14/24

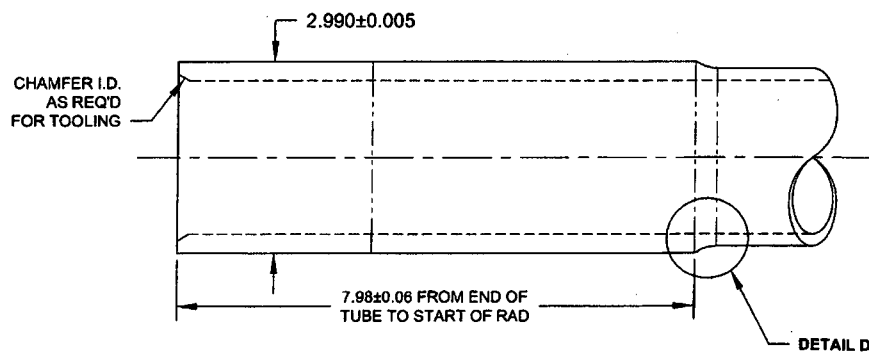
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D412-664-443	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI AFT)	NTS
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D412-664-443TRN
TURNING DETAIL

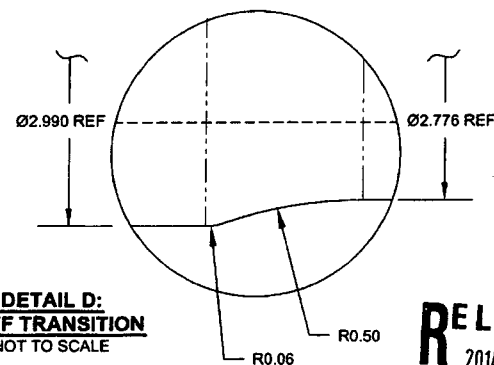
UNDER REVIEW

UP 15/4/20



DETAIL C:
CUFF TRANSITION
SCALE 4X

DETAIL D:
CUFF TRANSITION
NOT TO SCALE



RELEASED
2014-05-26

DESIGN	DP	DART AEROSPACE LTD	
DRAWN	DP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DP	DRAWING NO.	REV. A
MFG. APPR.	DP	D412-664-443	SHEET 4 OF 4
APPROVED	DP	TITLE	SCALE
DE APPR.	DP	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
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DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☒ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐				
Date: 15/10/19		Step #: 200		QTY Effective: 1		MRB (QSI042) Approval		
Description Work Order Deviation				Disposition				
USE AXALTA PRE-TREATMENT PER QSI 605				Axalta B205S B/N: 132520 Axalta Metabek 236S B/N: 132474				DAS 12 15/10/19 9-89
								Completed By DAS 41 9-89 5-10-26
								Lead hand / Supervisor Approval Verification
QC / QA Coordinator Approval								
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐				FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐				
OTHER : _____				Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐				

D412-664-403 Stainless Steel Hardened Crosstube

TRN # 132993

setup

3.25" rollers

Bend lines are @ 32", 35" from centerline of tube

1.75" shims are used in the buggy for side bends

Middle Bend

Middle bend goes from 35" line with crosstube being on the large table of the machine.

Approach for middle bend is 2870 on both rollers. Run programs middle auto, middle 6 check.

Side Bends

Run programs side 1-10 down the taper from 32" tangent line. Approach is 2900 on Y roller and 3385 on W roller. Programs 1-5 go back to the tangent line ready for next bend. Program 6-10 release at the end. Approaches on programs 6-10 are on the first line of programs... Programs 11-15 run down taper for 9" then come back up to finish tube slowly, be careful with these programs...

Enjoy

Notes:

13/12/12 ran 1 tube, program middle 6 was not enough, prog middle 7 overbent slightly. will create middle 6b to be a halfway point. after program 7 we ran the tube as per folio. one side finished nicely at program 10, the opposite side finished nicely after running program 1 2 times, then 13 to finish. this left the tube closer to max tolerance on the span, 53.730/53.800.

15/06/03 middle auto has been made but, due to the long program, only contains programs 1-5. program 6 must be run separately prior to checking tube on wall.

2	Auto	2
4	6	4
6	7	6
7		7



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO30242**

Purchase Order Date 10/23/2015

PO Print Date 10/23/2015

Page Number 3 of 3

Order From :
SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name
Vendor Phone 905-678-5636

Ship To Contact
Ship To Phone
Ship Via: Delivered
Ship Acct:

Buyer Chantal Lavoie
Customer POID
Customer Tax # 10127-2607
Terms Net 30
Currency CAD
FOB FCA - (Free Carrier)

6	137871	D412-664-403 CROSSTUBE	10/23/2015	1.00	\$135.00	\$135.00
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LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Yes
10/23/2015

Line Total: \$135.00

7	137872	D412-664-403 CROSSTUBE	10/23/2015	1.00	\$135.00	\$135.00
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LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Yes
10/23/2015

15/10/23
SL

Line Total: \$135.00

Line Total: \$135.00

PO Total: \$810.00

CL

Note: Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Change Nbr: 2

Change Date: 10/23/2015

**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO26184	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 30242
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

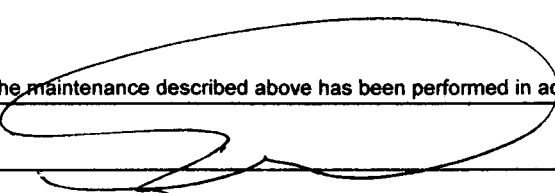
CARRY OUT NDT ON 6 CROSSTUBES AS PER PO30242

4 STAINLESS STEEL CROSSTUBES, ITEM ID# D412-664-403 , WORK ORDER ID# 137312,
137870, 137871, 137872

2 AFT CROSSTUBES , ITEM ID# D212-664-207 , WORK ORDER ID# 136262, 133190

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M-13 ***NO CRACK FOUND*** PEN. ZL-56, MPO13600, UV M-20141, CLEANER SKC-S MPO13923 , DEV. MPO11715						OCT 23 2015	 
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	
		EB					
		15-10-29					

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: OCT 23 2015
Name: RAFIK MELIKIAN		

DQA:

Date:

15/12/09

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed:

Date:

Work Order update only ☐

Work Order: <u>137872</u>		DISPOSITION		AGAINST DEPARTMENT/PROCESS			
Part No. <u>D412-604-413</u>		Rework ☒	Skid-tube ☐	Cross tube ☒	Water Jet ☐	Engineering ☐	
NCR No. <u>15-5459</u>		Scrap ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	
		Use-as-is ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	
		Suspected Unapproved ☐	Large Fab ☐	Composite ☐	Supplier ☐		
Date: <u>15/11/11</u>	Step #: <u>200</u>	QTY Effective: <u>①</u>				MRB (QSI042) Approval	
Description Work Order Deviation				Disposition			
Put a bead of Proseal around center support, to prevent water penetration.				Proseal 890 B/N <u>133071</u> exp 2/16			
				Completed By DAS 41 15-11-19			
				Lead Hand / Supervisor Approval Verification DAS 9 9-89 15-11-19			
				QC / QA Coordinator Approval DAS 9 9-89 15-11-19			
Root Cause		FAULT CATEGORY					
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐		
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐		
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐		
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐		
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐		
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐		
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☒		
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐		
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐		
Substation ☐	Process Improvement ☒	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐		
Past Expiry Date ☐	Manufacturing Process ☐						
Misidentified ☐	Past Due ☐	OTHER :					